
Space Weather Forecast

Issued on Wednesday, 11 January 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Moderate solar activity likely. Chance of X-class flares (R3; Strong radio blackouts) throughout. A possible glancing blow from a CME on the 12th January.

Solar Activity: Solar activity has been High over the past 24 hours, with a Strong flare originating from the numbered sunspot region that recently rotated across the northeast limb. There are seven other numbered sunspot regions on the Earth facing disc. The two largest and most complex continue to reside in the southeast and southwest quadrants. Another region in the far southeast of the disc has also been active. The remaining spots are all relatively small and have remained largely inactive. A Moderate flare occurring on 9th Jan from the large region in the southwest produced a CME which may give a glancing blow at Earth on day 2 (12th Jan), although this is a low probability. No other Earth-directed CMEs feature in the forecast.

Solar Wind / Geomagnetic Activity: Solar winds have been at mostly slow levels through the period with an upward trend to reach slightly elevated in recent hours. Total Interplanetary Magnetic Field was weak to moderate, while the important north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring, although there was a small, short enhancement observed 24 hours ago at just after midnight UTC.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate, with a chance of becoming High from any Strong flares through the forecast period, these most likely from the two largest regions on the disc, or the two regions in the southeast and northeast quadrants, that have recently emerged across the limb.

Solar Wind / Geomagnetic Activity: A Moderate flare from the sunspot region in the southwest generated a CME early on the 9th, which may give a glancing blow at Earth on day 2 (12 Jan), although this carries a low probability. No other Earth-directed CMEs feature in the forecast. Solar winds are now slightly elevated, perhaps due to connection to an anticipated fast wind, with a probable decline over coming days. Geomagnetic activity is expected to be Quiet to Unsettled, with a slight chance of Active or G1/Minor Storm Activity at first. During Day 2 (12th Jan) there is the slight chance of a glancing blow from the CME from the 9th Jan, which may increase geomagnetic activity, potentially lasting into Day 3 (13th Jan), before activity declines again.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at background levels. However, there is a risk of an increase should any significant flares occur, giving a slight chance of exceeding the S1/Minor Storm threshold.

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Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	80	90	90
Very Active	R3 to R5 X	Yes	25	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)